REMARKS

Claims 8, and 43-65 remain in this application. Claims 1-7 and 9-42 have been canceled without prejudice. Claim 8 has been amended. Claims 43-65 are new. No new matter has been added. Reconsideration is respectfully requested.

Claims 1-7, 9-10, 13-28, 30, and 32-36 were rejected under U.S.C. §103(a) over "Coverability Analysis Using Symbolic Model Checking" by Ur et al. (Ur) in view of the Background of the Invention (BOTI) and in view of "Dominators, super blocks, and program coverage" by Agrawal. These claims have been canceled.

Claims 11 and 29 were rejected under U.S.C. §103(a) over Ur in view of BOTI and Agrawal, and further in view of U. S. Patent 5,579,515 to Hintz et al. These claims have been canceled.

Claims 11 and 29 were rejected under U.S.C. §103(a) over Ur in view of BOTI and Agrawal, and further in view of U. S. Patent 6,484,134 to Hoskote. These claims have been canceled.

Claim 8 was rejected under U.S.C. §103(a) over Ur in view of the BOTI and in view of Agrawal. Claim 8 has been amended to depend from new claim 43. In view of the amendment, applicant believes that the rejection is moot.

New independent claim 43 recites a method for coverability analysis on software under test (SUT). As recited by the claim, running a symbolic model checker identifies uncoverable elements of the SUT. The run also checks coverability task rules for the SUT, gives the results of the check, and from the results generates a coverability metric for the SUT. Based on the value of the metric, a set of the uncoverable elements is identified that on removal should have no effect on the SUT. The set comprises elements that are expected to be

effectively superfluous for execution of the SUT. The set is excluded from the SUT, and coverage analysis is performed on the excluded-set-SUT.

By excluding the set of uncoverable elements from the SUT, and then performing coverage analysis on the excluded-set-SUT, SUT designers can verify whether or not the identified set of uncoverable elements is indeed superfluous. If the set is superfluous, then anticipated results from coverage analysis on the excluded-set-SUT, for example, a coverage metric of 100% statement coverage, can also be considered a valid measure of the SUT. Furthermore, knowledge that the set is superfluous means that the coverability metric derived from the run of the symbolic model checker may also be considered a valid measure of the SUT. Alternatively, a coverage metric for the excluded-set-SUT that is lower than anticipated points to errors or omissions in the design of the SUT, and/or in the choice of elements in the excluded set. SUT designers can thus use the combination of generating a coverability metric, and performing coverage analysis, as recited in claim 43, to improve and/or verify the design of the SUT.

Support for claim 43 is found in paragraph [0090] of the specification.

Ur describes the use of coverability analysis and coverability metrics in symbolic model checking. Ur states that "Because our approach exploit (sic) Symbolic Model Checking, there is no need for test generation" (paragraph 5, page 1). Furthermore, careful search of Ur gives no hint or suggestion to perform any such test, as is required for coverage analysis, by excluding elements from a software-under-test. Claim 43 requires exactly this, i.e., coverage analysis while excluding elements.

Agrawal presents techniques for finding subsets of

nodes in a flowgraph, in reference to developing a test set that exercises all the nodes. Agrawal refers to the problem of covering all the nodes as a block coverage problem. However, Agrawal does not identify uncoverable elements, or compute a coverability metric. Both are required by claim 43.

Hintz describes a method for checking index integrity in a database. There is no suggestion whatsoever in the whole of Hintz's disclosure to use coverage analysis, coverability, or a metric for this, as is required by claim 43.

Hoskote describes a coverage metric to identify that part of a state space which is covered by properties verified by model checking. However, Hoskote does not generate rules corresponding to coverability tasks, identify uncoverable elements, or compute a coverability metric, all of which are required by claim 43.

Thus none of the cited art shows any hint or suggestion of using coverability analysis for identifying a set of SUT elements that on removal should have no effect on the SUT, excluding the identified elements, and performing coverage analysis on the excluded-set-SUT. This combination of features is required by independent claim 43. Claim 43 is therefore believed to be patentable over the cited art.

New claim 44 depends from claim 43, and recites an element that was an element of canceled claim 1.

New claims 45-49 depend from claim 43 and recite elements delineating the set of uncoverable elements. The elements for claims 45-49 find support in paragraphs [0089] and [0090] of the specification.

In view of the patentability of claim 43, amended claim 8 and new claims 45-49 are also believed to be patentable.

New independent claims 50 and 58 respectively recite apparatus and a computer software product that operate according to principles similar to those of claim 43. In view of the patentability of claim 43, claims 50 and 58 are also believed to be patentable.

New claims 51-57 and 59-65 depend respectively from claims 50 and 58. Claims 51 and 59 recite an element similar to an element in canceled claim 1. Claims 52-57 and 60-65 are supported in paragraphs [0089] and [0090] of the specification. In view of the patentability of claims 50 and 58, claims 51-57 and 59-65 are believed to also be patentable.

Applicant believes that the above amendments and remarks are fully responsive to all of the objections and grounds of rejection raised by the Examiner. In view of these amendments and remarks, applicant respectfully submits that all of the claims currently pending in the present application are in order for allowance. Notice to this effect is respectfully requested.

Respectfully submitted,

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